

REMARKS

Claims 1-6, 8-11 and 19 are pending and at issue in the application with claims 1 and 19 being the independent claims. Reconsideration and withdrawal of the rejections in view of the remarks below is respectfully requested.

Each of claims 1-6 and 8-11 recites a semiconductor power module that includes a heat sink comprising a compound of at least one of AlN and BeO. The heat sink directly contacts a lead frame and includes an electrical insulating property and thermal conductivity.

Claim 19 recites a semiconductor power module that includes a heat sink consisting of Al₂O₃. The heat sink directly contacts a lead frame and includes an electrical insulating property and thermal conductivity.

Claims 1-2, 4 and 10 were rejected as anticipated by Mehr (U.S. Pat. No. 5,530,295). Claims 3, 5 and 11 were rejected as unpatentable over Mehr in view of Majumdar et al. (U.S. Pat. 5,703,399). Claim 6 was rejected as unpatentable over Mehr in view of McCarthy et al. (U.S. Pat. 3,956,726). Claim 8 was rejected as unpatentable over Mehr in view of Tomita et al. (U.S. Pat. No. 5,440,169). Claim 9 was rejected as unpatentable over Mehr and Tomita et al. further in view of Majumdar et al. The applicants respectfully traverse the rejections.

The applicants respectfully submit that claim 1 is not anticipated by Mehr, because Mehr does not teach each and every element of claim 1. In particular, Mehr does not teach or suggest a heat sink comprising AlN and/or BeO. Mehr discloses a heat sink (22) pressed against a lead frame (18). The heat sink (22) is made of a thermally conductive material such as nickel plated copper or anodized aluminum. (Mehr, col. 2, ll. 37-47) However, Mehr does not disclose or suggest that the heat sink (22) may be made of AlN and/or BeO, as recited in claim 1.

Therefore, claim 1 is not anticipated by Mehr. Moreover, as claim 1 is allowable over the art of record, claims 2, 4 and 10 are allowable as being dependent on claim 1.

Likewise, none of Majumdar et al., McCarthy et al. or Tomita et al. discloses or suggests a heat sink comprising AlN and/or BeO. Therefore, none of Majumdar et al.,

McCarthy et al. or Tomita et al., either alone or in combination with Mehr, renders any of claims 1-6 and 8-11 obvious.

Newly added claim 19 recites a semiconductor power module that includes a heat sink consisting of Al_2O_3 . Mehr does not disclose a heat sink consisting of Al_2O_3 alone. Although Mehr discloses a heat sink (22) made of anodized aluminum, anodized aluminum only includes a layer of Al_2O_3 on an aluminum body, and does not consist of Al_2O_3 alone. (Mehr, col. 2, ll. 37-47) As explained in Acocella et al. (U.S. Pat. No. 5,031,029), anodized aluminum only provides an aluminum oxide layer on an aluminum body. (Acocella et al., col. 1, ll. 24-27) Yin et al. (U.S. Pat. No. 6,471,822) also discloses that anodized aluminum only includes a layer of aluminum oxide on the surface of an aluminum body. (Yin et al., col. 13, ll. 64-67). As such, the anodized aluminum heat sink of Mehr only includes Al_2O_3 on the surface and uses un-oxidized aluminum for the body. The heat sink (22) of Mehr does not consist of Al_2O_3 alone, as recited in claim 19. Because Mehr does not disclose or suggest a heat sink consisting of Al_2O_3 , as recited by claim 19, Mehr does not anticipate claim 19 or render claim 19 obvious.

Likewise, none of Majumdar et al., McCarthy et al. or Tomita et al. discloses or suggests a heat sink consisting of Al_2O_3 . Therefore, none of Majumdar et al., McCarthy et al. or Tomita et al., either alone or in combination with Mehr, renders claim 19 obvious.

CONCLUSION

Accordingly, the applicants respectfully submit that all pending claims are patentable over the art of record and should be allowed. In the light of the foregoing, prompt issuance of a notice of allowance is respectfully solicited.

Should the examiner have any questions, she is respectfully invited to telephone the undersigned.

Respectfully submitted,

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July 7, 2005